***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
	TIER 1 – BASE Model		
1.	**TIER 1** Inventory data: - Individual forest stand inventory data; and, - Forest stand growth and yield - Inventory data gaps - Species groups - Site classifications	Forest Estate modeling requires current forest inventory data. During the process of undertaking the preliminary analysis, a forest inventory data set was developed from the department's Forest Resource Inventory System data set (FRIS). Forest Inventory Units (FIUs) in the FRIS data set were grown using the Forest Vegetation Simulator (FVS) model to December 2001 and were updated for management activities from the department's Planning and Tracking database (spatial data locked and taken in October, 2001). This new data set is labeled as Sustainable Harvest Forest Inventory dataset (beta version), to distinguish it from the corporate land coverage database, FRIS. If stand level inventory parameters such as basal area, height, quadratic-mean-diameter, and stocking are not imported for a forested polygon (or FIU), OPTIONS assigns values according to the yield tables for that species, site class and management regime. Forest Resource Plan, Policy 3, 9, **11,** 12 WAC 222-16, Page 16-17	Stand-level growth and yield are critical elements of the simulation process. Reliable forest inventory data, including stand age, species mix and volume, are essential for long-range forecasts of a forested land base. OPTIONS software, for determining the sustainable harvest level, has its own internal growth and yield algorithms. Species, site class, silvicultural regime and age parameters control these algorithms. User-specified yield tables supply the basic growth rates. Yield tables may be derived from any source; however, OPTIONS has a built-in link to the Stand Projection System (SPS). First, SPS is utilized to build the yield tables in all the following scenarios, and secondly, the yield tables are adjusted for the Sustainable Harvest Forest Inventory (beta version). Separate yield tables are developed for naturally regenerated and for planted stands of all species groups and site classes. Regardless of stand type, stands older than 40 years are assumed to be naturally regenerated. The five site index classes are defined: • V: 0 - 75 • IV: 76 - 96 • III: 97 - 118 • II: 119 - 136 • I: 137 - 999 Assumptions for average site indices, missing ages, species groups and harvest priorities are under development. During the course of a simulation run, stands may switch to other regimes and species, as

[1] All modeling assumptions are under review and none have been field verified.

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

DRAFT Summary Modeling Assumption for Preliminary Tier Analysis			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
			per the definition for a scenario of treatments and harvests.
2.	**TIER 1** Natural Disturbances	Western Washington has a low rate of disturbance of fire, pest infestation, disease and landslides. Forest Resource Plan, Polices 9 & 10	Effects of natural disturbances are assumed to be accounted for in inventory and growth and yield estimates.
3.	**TIER 1** Ownership Groups	Forest estate management modeling requires the determination of a land base. The Forest Resource Plan established that the Department will calculate harvest levels in Western Washington based on the following ownership groups: • Forest Board Transfer lands (harvest by County)	The simulations of the Sustained Yield Calculations are organized at the department's administrative unit levels • Northwest • Southwest, Central & Capitol Forest • South Puget Sound & Olympic • Olympic Experimental State Forest Individual ownership groups as described in

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
		• Federal Grant lands and Forest Board Purchase lands (harvest by DNR Region) • Capital State Forest • Olympic Experimental State Forest Forest Resource Plan Policy 6	the Forest Resource Plan control relative even-flow harvest volume.
4.	**TIER 1** Sustained, Even Flow	As timber production and harvest regulation are objectives of a forest estate modeling exercise, then it is necessary to describe objectives about the desired flow of timber harvest in terms of type and planning period length. RCW 79.68.030 –"Sustained yield plans as used in RCW 79.01.128, 79.44.003 and this chapter shall mean management of the forest to provide harvesting on a continuing basis without major prolonged curtailment or cessation of harvest." The Forest Resource Plan established that the Department will manage state trust forestlands to produce a sustainable, even-flow harvest of timber, subject to economic, environmental and regulatory considerations. The Forest Resource Plan also established a planning period of 200 years. Forest Resource Plan, Policy 4	The simulations of the Sustained Yield Calculations per ownership include economic, environmental and regulatory considerations and are completed to allow a sustained, relative even-flow. It is assumed that a "relative even-flow" approach may provide an improved representation of future harvest level fluctuations. The method for accepting a simulation run using the "relative even-flow" definition involves a two-step process: **Step 1**. The long-term Sustainable Harvest Level will be estimated as an average of the 200 annual harvest levels using the simulations of the Sustained Yield Calculation. By graphing this average over the 200-year simulation, the estimate of the Sustainable Harvest Level will always have a neutral slope. **Step 2**. The fluctuation of the estimated average decadal harvest levels will be considered reasonable if within +/-25% of the estimated Sustainable Harvest Level (step 1). Since 1965, the ten-year average is within +/-25% of the average annual Westside volume reported as harvested. This approach may be subject to revisions based on preliminary results of sensitivity analyses.
5.	**TIER 1** Harvest Levels Based on Volume	As timber production and harvest regulation are objectives of forest estate modeling, then it is necessary to describe objectives about what is to be regulated over the planning period: volume, area or a combination of both. The Forest Resource Plan established that the Department shall establish the timber harvest calculation based on volume rather that acreage or other considerations.	The simulations of the Sustained Yield Calculations per ownership are regulated per harvest volume. Harvest volume is calculated based on merchantability criteria of net thousand board feet. No objective for quality or volume type is specified.

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
		Forest Resource Plan, Policy 5	
6.	**TIER 1** Riparian area: Accounting for unmapped and misclassified streams	Implementation of the 1996 Sustainable Harvest calculation demonstrated that the length and number of streams per type were underestimated. From field experience, the current Forest Practices GIS hydro layer continues to underestimate the "actual" number of streams' miles by type. Although no buffers are applied to streams in Tier 1, the underestimated length of stream should be accounted for, as these are non-productive acreages. Forest Resource Plan, Policy 20	No riparian buffers are applied. Unmapped and misclassified streams are not considered.
7.	**TIER 1** Land Use Classifications: On-base and off-base lands	Land that is currently designated as "off-base" is not eligible for timber harvest. Off-base lands in Tier 1 include: Natural Resource Conservation Areas (NRCAs) & Natural Area Preserves (NAPs) The Forest Resource Plan Policy 3, recognized that there were 200,000 acres of off-base land classifications that were not considered permanent. These lands may, therefore, contribute to conservation objectives and occasionally may contribute harvest volume for specific department objectives. These categories included approximately 15,000 acres of stands older than 160 years in the OESF to be deferred until 2005 and 200 acres of Old Growth Research Areas to be deferred until 2002 or the duration of the Forest Resource Plan (2009?). Twenty-four hundred acres of Gene Pool Reserves were deferred indefinitely. Regarding "transition lands," Forest Resource Plan Policies 1 & 2 recognize that such lands will be replaced with productive forestlands. Forest Resource Plan Policy 1, 2, 3, 11	All lands within "off-base" designated areas may have the potential to contribute to conservation objectives. With the exception of NRCAs and NAPs, these lands may also have the potential to contribute long-term harvestable volumes and are available for any type of treatments such as regeneration harvest, small wood thinnings and older stand thinnings.
8.	**TIER 1** Rotation age	As timber production is an objective of a forest estate modeling, then it is necessary to describe the desired rotation age at which a stand should be harvested for timber and re-established. Rotation age for a forest stand also, in part,	There is no one optimal rotation age for all stands. Therefore, a minimal regeneration harvest age is simulated by site class, to reflect the range of productivity of department-managed lands. • V - 80 years

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
		determines the types of products, services and amenities that a forest estate will provide over time. The Forest Resource Plan discusses the average rotation age to be 60 years, unless other management objectives, for example, diversity, wildlife conservation, etc., determine an alternate course of action. Therefore, some stands may be cut as early as 45 years and other stands only when trees reach 100 years. The actual average rotation age is approximately 60 years over an ownership group and is determined by operational implementation of relative even-flow harvest levels, habitat considerations, watershed functions, etc. Forest Resource Plan, Policy 4 & 11	• IV - 70 years • III - 65 years • II - 55 years • I - 45 years A majority of department-managed lands are in site classes II & III. Each of the other classes represents a smaller proportion of activities. Therefore, it is assumed that less than 1% of lands will have an estimated harvest age of 45 years.
9.	**TIER 1** Management Regimes	Timber harvest modeling requires a description of the silvicultural management regimes that will likely be implemented The Forest Resource Plan guides the Department to apply sound forest management practices on state trust forest lands. Forest Resource Plan, Policy 16, 30, 31, 32, 33, & 34	As a modeling assumption, a stand can be thinned only if it meets the following minimum thinning criteria threshold: • 55 Curtis relative density (RD) • Harvestable 10 mbf per acre • Thinning from below (0.9) Relative density, and d/D ratios are assumed necessary to simulate silvicultural practices. 10 mbf per acre is assumed to be the threshold of marketable volume based on historical harvest reports and marketing analysis. All simulated regeneration harvest are re-planted. Effects of fertilization and genetically improved stocking are not applied in the model. A harvest treatment priority is applied to respond to the current department practices: 1. Regeneration harvest 2. Small wood thinnings 3. Older stand harvests In consideration of operational feasibility and current procedures for prioritizing operational activities, polygons created in the overlay process are grouped by RIU_ID and are sorted in descending order by 1. Proximity to mapped forest roads 2. Species group 3. Site class

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
			4. Curtis relative density. For a more in-depth description of simulated management regimes, see "Simulating Region Silvicultural Practices for the Sustained Yield Calculation."
10.	**TIER 1** Roads and Harvest Systems	Roads are assumed an integral part of forest management activities and logging systems must be appropriate so that yarding and skidding are economical and ecological; therefore, the department's activities are simulated with harvesting and road management assumptions. Forest Resource Plan, Policy 19, 25, 26, 27, **28**,29 WAC 222-30-010 (2), (3), and (4)	Known "limits of construction," borrow-pits, fish-passages, and landing clearings are estimated based on currently mapped roads using the TRANS GIS layer. These simulated areas are assumed to not contribute forest habitat structure or harvestable volume. Simulated road foot prints widths are: • Primary roads: 100 feet • Secondary roads: 100 feet • Other paved roads: 66 feet • Unpaved roads: 60 feet • Trails: 30 feet
TIER 2 – REGULATORY MODEL ***Under development, will include all assumption from Tier 1***			
11.	**TIER 2**	**Forth coming**	**Assumptions under development**
TIER 3 FOREST RESOURCE PLAN, REGULATORY AND HCP BASELINE *(TIER 3 includes all the assumptions in TIER 1, except Assumption No. 1 Inventory, No. 6 Riparian area and No.7 Land Use Classifications, which is replaced by Assumption No. 31*			
12.	**TIER 3** Accounting for unmapped and mistyped streams (version 3) *(This assumption will replace assumption No. 6 and No. 12)*	Implementation of the 1996 Sustainable Harvest calculation demonstrated that the length and number of streams per type was underestimated. From field experience, the current Forest Practices GIS hydro layer continues to underestimate the "actual" number of streams miles by type. Although the exact locations of these undocumented streams are unknown, these acreages affect harvestable volumes.	See attached document "Riparian Management Buffers – GIS data preparation and assumptions." Under development

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
13.	**TIER 3** Roads and Harvest Systems	Roads are assumed an integral part of forest management activities and logging systems must be appropriate so that yarding and skidding are economical and ecological; therefore, the department's activities are simulated with harvesting and road management assumptions. Forest Resource Plan, Policy 19, 25, 26, 27, **28**,29 HCP IV. 62-68, 199	Known "limits of construction," borrow-pits, fish-passages, and landing clearings are estimated based on currently mapped roads using the TRANS GIS layer as in Tiers 1 and 2. Un-mapped roads and future construction are simulated for 100 years with a 90% yield reduction for 5% of the area of a simulated harvest, which is older than rotation age and further than 800 feet from a currently mapped road. Under the HCP, Westside total road footprint areas are assumed to not exceed 32 acres per square mile. The HCP road management strategies including yarding corridors and longer yarding distances account for an estimated reduction in affected areas from the Tier 2 Road assumption.
14.	**TIER 3** Riparian areas: Buffer widths by water type	According to the HCP, confirmed buffer widths established for all stream types include: Stream Type — RMZ Width — Wind Buffer 1 — SPTH* — 100' 2 — SPTH — 100' 3 — SPTH — 50' 4 — 100' — 0' 5 — Protection levels to be determined — 0' Forest Resource Plan Policy 19, **20**, 30, 31, 32, 32, 34 HCP, Section IV, Pages 56, 59 *Site Potential Tree Height at 100 years; this distance measured horizontally from the edge of the 100-year flood plain.	See attached document "Riparian Management Buffers – GIS data preparation and assumptions." Under development
15.	**TIER 3** Riparian areas: Timber harvest in riparian management areas	The HCP commitment for harvest in riparian areas includes no harvest in a 0-25 ft. zone, ecosystem restoration and selective removal of single trees in 25 ft to SPTH zone (minimal harvest), and the remaining portion of buffer shall be low harvest (this portion includes wind buffer). The minimal and low harvest areas can remove no more than 10% of conifer and/or 20% hardwood volume per rotation.	Management activities in the riparian management zone are deferred until beginning of 2005. Successive thinnings, road development, fish-passages, and yarding corridors are allowed to occur in riparian areas and wind buffers. The modeling of management activities

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
		Implementation procedures to be developed for adaptive management with review by USFWS/NMFS. Forest Resource Plan Policy 19, **20**, 30, 31, 32, 32, 34 HCP: Section IV, Page 61	within the first 25-feet of a stream includes only ecosystem restoration activities, road building and yarding corridors. If harvest openings exceed 10% at the riparian stand level, then 100% of the riparian area is deferred for a every 30-year period, regardless of stand type. Thirty years is chosen as a deferral period between potentially adjacent upland harvest activities. Because of overlapping GIS layers, mass-wasting assumptions may also apply in conjunction with riparian areas. To insure minimal simulated impact on the area, thinning treatment rules and growth responses apply. Regeneration harvests are not simulated in the riparian buffers. 5% of the simulated wind buffer area is deferred from harvest for every 30-year period.
16.	**TIER 3** Wetlands: Accounting for missing or mis-mapped wetlands	Implementation of the 1996 Sustainable Harvest calculation demonstrated that the number and size of wetlands was underestimated. From field experience, the current Forest Practices GIS hydro layer continues to underestimate the "actual" number and size of wetlands. Although the exact locations of these undocumented streams are unknown, these acreages may affect harvestable volumes.	Currently, no modeling assumptions are developed to account for unmapped or mis-mapped wetlands.
17.	**TIER 3** Wetlands: Width of wetland buffers	Wetland Size (Acres) / Buffer Width (Feet) 0.25-1.0 — 100 >1 — 150 Forest Resource Plan Policy 19, **21** HCP: Section IV, Page 69	GIS buffers are developed as the rule describes.
18.	**TIER 3** Wetlands: Timber harvest in wetlands and wetland buffers	Retain a minimum basal area of 120 square feet per acre in each site class; volume will vary depending on site class. Forest Resource Plan Policy 19, **21** HCP: Section IV, Page 70	In the wetland and wetland buffer area, all harvest treatments are allowed to occur in wetlands and buffers areas so long as a basal area of at least 120 sq/ft/acre is targeted over 90% of the simulated area. If harvest openings exceed 10% at the stand level, then 100% of the simulated wetland and buffer area is deferred for every 30-year period, regardless of stand type.

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
			To insure minimal simulated impact on the area, thinning treatment rules and growth responses apply. These values have not been field verified.
19.	**TIER 3** Unstable slopes: Deep seated	As stand health management and mitigation of timber production for identified hazards and risks of unstable slopes is an objective of forest estate modeling, then it is necessary to estimate the likelihood that a proposed forest practices will cause movement on the potentially unstable slopes or landforms, or contribute to further movement of a potentially unstable slope or landform **and** delivery of sediment or debris to any public resources, or in a manner that would threaten public safety. Forest Resource Plan Policy 3, 9, 11, **19, 28** HCP, Section IV, Pages 68, 69 and 75	Slope stability is commonly associated with roads. Road areas are considered excluded from contributing to forest capacity objectives of Tier analysis. However, forest practices that include the removal of timber in potentially unstable areas are often restricted in practice as a measure of mitigating potential hazards and risks. Deep-seated unstable slopes are modeled where by 70% of a deep-seated landslide polygon is assumed to be available for all harvest treatments. The remaining area (30% of the polygon) is available for thinnings only. If 30% of the area has a regeneration harvest, the deep-seated landslide polygon becomes automatically deferred from regeneration harvest for at least of 30-years to insure minimal impact on the area. These values have not been field verified.
20.	**TIER 3** Unstable slopes: Shallow/rapid	As stand health management and mitigation of timber production for potential hazards and risks of unstable slopes is an objective of a forest estate modeling, then it is necessary to estimate the likelihood that a proposed forest practices will cause movement on the potentially unstable slopes or landforms, or contribute to further movement of a potentially unstable slope or landform **and** the likelihood of delivery of sediment or debris to any public resources, or in a manner that would threaten public safety. Forest Resource Plan Policy 3, 9, 11, **19, 28** HCP, Section IV, Pages 68, 69 and 75	Slope stability is commonly associated with roads. Road areas are considered excluded from contributing to Tier analysis objectives. However, forest practices that include the removal of timber in potentially unstable areas are often restricted in practice as a measure of mitigating potential hazards and risks. Shallow rapid unstable slopes are modeled where by 30% of a SMORPH (high risk, 30-meter resolution) model polygon is assumed to be available for all harvest treatments. The remaining area (70% of the polygon) is available for thinnings only. If 30% of the area has a regeneration harvest, the shallow-rapid polygon becomes automatically deferred from regeneration harvest for at least of 30-years to insure minimal impact on the area.

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

DRAFT Summary Modeling Assumption for Preliminary Tier Analysis			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
			These values have not been field verified.
21.	**TIER 3** Spotted owl: NRF definition: Sub-mature habitat	As per the HCP, it necessary to estimate the assumed definition of average stand conditions that suggests that a stand meets the desired characteristics of sub-mature habitat. HCP IV, 12 Sub-Mature Habitat As average stand conditions, sub-mature habitat will have the following characteristics. • TPA of Conifers >= 30% (dominant, co-dominant, and intermediate trees) • canopy closer >=70% • between 115 and 280 TPA > 4" dbh • Dominant and co-dominant trees at least 85 feet tall • At least 3 snags or cavity TPA >= 20" dbh. • Ground cover of LWD >= 5% Forest Resource Plan Policy **22, 23** HCP Section IV, Page 4	A stand (FIU) with a BA of 240 sq/ft/acre is assumed to meet the definition of average stand conditions for the desired characteristics of sub-mature habitat. NOTE: OPTIONS software is limited in how one can set constraints and targets.
22.	**TIER 3** Spotted owl: Timber harvest from NRF habitat devoted to providing target	As per the HCP in WAUs designated as Nesting, Roosting and Foraging habitat (NRF), DNR shall provide and maintain a **target** condition of at least 50% of its managed lands within each WAU as NRF sub-mature habitat. Forest Resource Plan Policy **22, 23,** 30, 31, 33, 34 HCP Section IV, Page 4 HCP Section IV, Page 11&12	A target is set so that at least 50% of the department designated areas for NRF management within a WAU is deferred from simulated regeneration harvests. Stands with the highest basal area are selected until the 50% target is met. These "selected" stands are restricted from regeneration harvests for a period of 20 years. This targeting process is repeated on a 20 year cycle to ensure that at least the minimal area capable of providing habitat is targeted for conservation for a significant length of time and so that the mosaic of areas meeting the 50% target may move around. In cases where there is insufficient acreage with a basal area of 240 sq ft/acre or greater, the records with the next highest basal area are selected. During the 20 years period, these targeted areas are considered operationally feasible for thinning to maintain habitat. The

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
			remaining area is assumed to be operationally feasible for any harvest treatments such as regeneration harvest, small-wood thinning and older stand thinning.
23.	**TIER 3** Spotted owl: Dispersal definition	As per the HCP, dispersal habitat has the following minimal characteristics: (HCP IV, 12) • Canopy cover of at least 70% • QMD for the 100 largest TPA >= 11" dbh • Top HT of the largest 40 TPA >= 85' • Retain at least 4 TPA from the largest size class. HCP Section IV, Page 11	A stand with a BA of 160 sq/ft/acre is assumed to meet the definition of minimal characteristics of dispersal habitat.
24.	**TIER 3** Spotted owl: Timber harvest from Dispersal habitat devoted to providing target	As per the HCP in WAUs designated as dispersal, DNR shall provide and maintain a **target** condition of at least 50% of its managed lands within each WAU as dispersal habitat. Forest Resource Plan Policy **22, 23,** 30, 31, 33, 34 HCP Section IV, Page 9.	A target is set so that at least 50% of the department designated areas for dispersal management within a WAU is deferred from simulated regeneration harvests. Stands with the highest basal area are selected until the 50% target is met. These "selected" stands are restricted from regeneration harvests for a period of 20 years. This targeting process is repeated on a 20 years cycle to ensure that at least the minimal area capable of providing habitat is targeted for conservation for a significant length of time and so that the mosaic of areas meeting the 50% target may move around. In cases where there is an insufficient acreage with a basal area of 160 sq ft/acre or greater, the records with the next highest basal area are selected. During the 20 years period, these targeted areas are considered operationally feasible for thinning to maintain habitat. The remaining area is assumed to be operationally feasible for any harvest treatments such as regeneration harvest, small-wood thinning and older stand thinning.
25.	**TIER 3** Spotted owl: 300-acre nest patches and buffers	As per HCP IV. 8, harvest in the 300-acre nest patches will be deferred during the research phase of the HCP.	The 300-acre core of the 66 designated nest patches and the area within a 0.7-mile radius of a designated nest patch, within department designated NRF management areas.

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
		HCP Commitment: Situate approximately 66 300-acre nest patches and two hundred acre nest patch buffers in west-side planning units. Defer timber harvest in nest patches until DNR demonstrates ability to create functional nesting habitat through silviculture. Forest Resource Plan Policy **22, 23** HCP Section IV, Page 6	
26.	**TIER 3** Spotted owl: Timber harvest in nest patch buffers	As per HCP IV. 6, at least 200 acres of sub-mature habitat will be maintained adjacent to a 300-acre nest patch. If such habitat is unavailable, the next highest quality and adjacent habitat should be identified. Defer timber harvest in nest patch buffers, unless harvested acres can be immediately replaced with habitat of equal or greater quality· Forest Resource Plan Policy **22, 23,** 30, 31, 33, 34 HCP Section IV, Page 6	If more than 10% openings occur in the 300-acre nest patch, then 100% of the area is deferred for 30 years. To insure minimal simulated impact on the area, thinning treatment rules and growth responses apply. A target is set so that a minimum of 200 acres of the ownership area within the 0.7-mile radius of a nest patch meets a target condition of 240 sq ft/acre or greater in basal area. In cases where there is less than 200 acres with a basal area of at least 240 sq ft/acre, records with the next highest basal area are selected for 50% of the area. These "selected" stands are restricted from regeneration harvests for a period of 20 years. This targeting process is repeated on an annual cycle such that a 200-acre mosaic may move around the nest patch buffer area. The remaining area in the 0.7-mile radius buffer is assumed available for all harvest treatments.
27.	**TIER 3** Marbled murrelet: Habitat identification	The HCP commitment is to identify and defer harvest of suitable murrelet habitat while conducting the following steps: Conduct a 2-year habitat relationship study to determine relative importance of various habitat types within each planning unit· Following completion of habitat relationship study, marginal habitat (expected to contain a maximum of 5% of the occupied sites) is made available for harvest. In each planning unit, all higher quality habitats will be inventory surveyed. Outside of Southwest Washington, surveyed, unoccupied	Under development

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
		habitat will be released for harvest (with some stipulations). Information obtained during these and other research efforts will be used to develop a long-term conservation strategy. Any occupied site identified prior to or during the process outlined above shall be protected until the long-term plan is developed and implemented. Forest Resource Plan Policy **22, 23** HCP, Section IV, Page 40	
28.	**TIER 3** Marbled murrelet: Timber harvest in habitat	The HCP commitment following completion of the habitat relationship study, marginal habitat will be made available for harvest (expected to contain a maximum of 5% of the occupied sites). In each planning unit, all higher quality habitats will be inventory surveyed. Outside of Southwest Washington, surveyed, unoccupied habitat will be released for harvest (with some stipulations). Information obtained during these and other research efforts will be used to develop a long-term conservation strategy. Any occupied site identified prior to or during the process outlined above shall be protected until the long-term plan is developed and implemented. Forest Resource Plan Policy **22, 23,** 30, 31, 33, 34 HCP, Section IV, Page 39	Under development
29.	**TIER 3** Rain-on-snow areas: Hydrologic maturity	The HCP commitment is to determine drainage sub-basins in which DNR must ensure two-thirds hydrologic maturity in the significant rain on snow zones **AND** maintain two-thirds of the acreage within these sub-basins in forest that is at least 25 years old, the age assumed to meet hydrologic maturity. Forest Resource Plan Policy **19** HCP, Section IV, Pages 68, 69 and 75	A target is set so that at least two-thirds of significant rain-on-snow areas must be at least 25 years of age or older at all times.
30.	**TIER 3** Wildlife reserve trees Legacy Trees	The HCP commitments are to permanently retain at least five live trees for each acre harvested. One of these must be from the largest diameter class. One additional tree must be from the dominant crown class. Three additional trees must be from the dominant, co-dominant or intermediate crown classes. Leave all snags where safe and practicable,	A constraint is set so that at least 7% of the area of each stand is deferred for wildlife reserve trees for regeneration harvest only. Regeneration harvests are restricted in these deferred areas for at least 200 years.

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

***DRAFT* Summary Modeling Assumption for Preliminary Tier Analysis**			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
		but at least three per acre on average must be left (15" dbh and 30' tall if available). If fewer than three snags per acre can be left, additional live trees will be retained so that the average per acre is at least eight. Forest Resource Plan, Policy No. 22, 23 HCP Section IV. Pages 156-157	To insure minimal simulated impact on these areas, thinning treatment rules and growth responses apply. These values have not been field verified.
31.	**TIER 3** Land-base Classifications	RCW 79.68.040, 79.68.060. The department shall periodically adjust acreages designated for inclusion in the sustained yield management program and calculate a sustainable harvest level. According to Forest Resource Policy 3, in 1992 there were approximately 200,000 acres of off-base land classifications that were not considered permanent. These lands may, therefore, contribute both to conservation objectives and occasionally may contribute harvest volume for specific department objectives. • 15,000 acres of stands older than 160 years in the OESF to be deferred until 2005 • 200 acres of Old Growth Research Areas to be deferred until 2002 or the duration of the forest Resource Plan (2009?) • 2,400 acres of Gene Pool Reserves were deferred indefinitely. • Regarding "transition lands," FRP Policies 1 & 2 recognize that such lands will be replaced with productive forestlands. Forest Resource Policy 1, 2, 3, 11, 13, 14, 15	The regions have provided detailed input and spatial GIS coverages input regarding land base classifications. Given stand health concerns and the uncertainty of harvestable volumes on these lands or future location of replacements, the proposed modeling assumption is that 50% of the area of all transition land designations are assumed to be operationally feasible for any type of treatments on a long-term basis. NRCAs and NAPs do not contribute to harvest volumes. The 50% harvest availability until 2012 is an arbitrary level and is chosen to represent the land transactions process. It is assumed that transition land will be transferred for productive forestland over the planning period.
32.	**TIER 3** Unmapped Concerns	Lands managed by the Department for forest production may have land-use issues associated with then. These land-use issues may not have specific geographical information (GIS). This assumptions has been developed to account for these so-called "unmapped" concerns. Included: Scenic highways: Forest Resource Plan, Policy 32 Recreation and view-sheds: Forest Resource Plan, Policy No. 25, 29	For each stand regenerated, an area of the stand is deferred for a period of time. The area to be deferred will vary by Department administrative units and the values are currently under development. Simulated regeneration harvests are restricted in these deferred areas for at least 50 years. Unmapped factors being considered include: o Streams and wetlands o Scenic highways o Recreation o View-sheds o Local operational constraints o Inaccessible areas

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**

DRAFT Summary Modeling Assumption for Preliminary Tier Analysis			
No	**Tier Level and Issue**	**Policy/Rule/Data**	**Modeling Assumption Implementation[1]**
			o Cultural resources o Archeological sites o Critical habitats
33.	**TIER 3** Green-up of Harvest Area	Harvest units should generally not exceed 100 acres. A 300-foot buffer of trees at least five years old or 4.5 feet tall is required between adjacent units whose sum of acreage may be greater than 100 acres. There is implied flexibility with the 100-acre practice. Forest Resource Plan, Policy No. 32	Under development
34.	**TIER 3** Municipal watersheds: Lake Whatcom	See RCW chapter 79.01.128 HCP IV. 192 Scenario simulations are subject to recommendations of the NW region office and the Lake Whatcom Landscape Advisory group.	Scenario simulations are subject to recommendations of the NW region office and the Lake Whatcom Landscape Advisory group.
35.	**TIER 3** Spotted owl: Previously regulated owl circles	As an important consideration of forest estate modeling, metering the "take" of DNR's internally identified category 1 and 2 circles, simulating metering and allowing small-wood thinning in non-habitat to occur in pre-specified circles is necessary. Forest Resource Plan, Policy No. 22, 23	The owl circles are metered out based on their respective release dates (to be determined). Thirty-three specified Category 1 Circles (Charlie Baum Memo 1) start becoming available for all harvest treatments in 2007. Sixty-one specified Category 2 Circles (Status 1-R and SW Washington Circles) start becoming available for all harvest treatments from 2002. Prior to their release, no regeneration harvest is simulated in the designated owl circles. To insure minimal simulated impact on the area, thinning treatment rules and growth responses apply. If more than 10% openings occur prior to the release year. These values have not been field verified.

- **Issues are cumulative for each sequential tier level.**
- **Tier levels and basic modeling assumptions are presented as a "start point", subject to Board of Natural Resources directions, Department review, discussions and analyses, and data verification and adjustments. All information subject to data and systems refinements and adjustments as indicated during the course of the sustainable harvest calculation project.**